

### **Amendments to the Claims**

Please cancel claims 7-23, 25, 34 and 36. Please amend claims 1 and 24. This listing of claims will replace all prior versions, and listing, of claims in the application.

#### **Listing of Claims:**

Claim 1 (Currently amended) A process for producing hydrogen from anaerobically digested organic materials comprising:

(i) applying an intermittent electric potential across said materials to produce hydrogen and carbon dioxide-wherein said electric potential comprises a voltage applied by a voltage source according to a duty cycle that is adjusted by a controller,

(ii) detecting methane production by gas detection means in communication with said controller;

(iii) applying a voltage for a first time period until methane production is depressed;

(iv) discontinuing application of voltage for a second time period;

(v) detecting resumption of methane production by said gas detection means;

(vi) applying a voltage for a third time period longer than said first time period;

(vii) discontinuing application of voltage across electrodes for a fourth time period shorter than the second time period in step (iv);

(viii) repeating steps (iii) – (vii) iteratively until methane production is minimized and hydrogen production is maximized.

Claim 2 (Previously presented) A process as in Claim 1 in which said intermittent application of said electric potential is timed to occur at a frequency and for a period to maximize the quantity of hydrogen produced per the amount of electricity consumed.

Claim 3 (Original) A process as in Claim 1 wherein a portion of said hydrogen is used by an energy conversion means to supply said electric potential.

Claim 4 (Previously presented) A process as in Claim 1 in which said intermittent application of said electric potential is timed to occur at a frequency and for a period to maximize the quantity of hydrogen produced per the amount of electricity consumed and wherein a portion of said hydrogen is used by an energy conversion means to supply said electric potential.

Claim 5 (Original) A process as in Claim 1 in which said electric potential is applied across electrodes.

Claim 6 (Original) A process as in Claim 1 in which said electric potential is applied across multiple electrodes.

Claims 7-23 (Canceled)

Claim 24 (Currently amended) A process for converting organic materials into a gaseous fuel, said process comprising anaerobically digesting organic materials in the presence of an intermittently applied electrical potential to produce carbon dioxide and a gaseous fuel comprising a mixture of hydrogen and methane, wherein said gaseous fuels comprise up to about 79% hydrogen gas.

Claim 25 (Canceled)

Claim 26 (Previously presented) The process of Claim 1 wherein formation of methane is suppressed.

Claim 27 (Previously presented) The process of Claim 1 wherein said electric potential is adaptively adjusted to minimize electric power consumption while maximizing hydrogen production.

Claim 28 (Previously presented) The process of Claim 1 wherein said electric potential is between 1 and 7 volts.

Claim 29 (Previously presented) The process of Claim 1 wherein said electric potential is between 3 and 6 volts.

Claim 30 (Previously presented) The process of Claim 1 wherein said electric potential is between 3.0 and 4.5 volts.

Claim 31 (Previously presented) The process of Claim 1 wherein said electric potential results in an electric current having low polarization.

Claim 32 (Previously presented) The process of Claim 1 wherein said electric potential results in an electric current having low ohmic losses.

Claim 33 (Previously presented) The process of Claim 6 wherein said electrodes are made from materials selected from the group consisting of lead, copper, steel, brass, carbon, cast iron bars, metal impregnated graphite and electrically conductive graphite.

Claim 34 (Canceled)

Claim 35 (Previously presented) The process of ~~Claim 34~~ Claim 1 wherein said voltage is adaptively adjusted to minimize energy expenditure.

Claim 36 (Canceled)

Claim 37 (Previously presented) The process of Claim 24 wherein said gaseous fuels have traces of methane.

Claim 38 (Previously presented) The process of Claim 24 wherein said gaseous fuels have no methane.